Problem J. Fast Bridges

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Let us consider a square city of size $k \times k$. There is exactly one house in each cell.

People can go from any cell to neighbouring cell (only by side) in 1 unit of time.

Government decided to build n fast bridges to make the city better. Each fast bridge connects two cells (x_1, y_1) and (x_2, y_2) such that $x_1 \neq x_2$ and $y_1 \neq y_2$. People can go from one end of the bridge to another in $|x_1 - x_2| + |y_1 - y_2| - 1$ units of time.

To analyze how the city became faster, you are asked to calculate the sum of shortest distances between all pairs of cells. Since it can be large, find it modulo 998 244 353.

Input

The first line contains two integers n, k ($0 \leq n \leq 500$, $2 \leq k \leq 10^9$) — the number of bridges and the size of the city.

Each of the next n lines contains four integers x_1, y_1, x_2, y_2 ($1 \leq x_1 < x_2 \leq k$, $1 \leq y_1, y_2 \leq k$, $y_1 \neq y_2$). It is guaranteed that all tuples (x_1, y_1, x_2, y_2) are different.

Output

Print a single integer — the answer to the problem.

Examples

standard input	standard output
2 2 1 1 2 2 1 2 2 1	6
0 1000000000	916520226
5 5 1 1 3 3 3 3 5 1 3 3 4 5 3 3 5 4 1 5 3 3	946

Note

In the first example, the shortest distance between all pairs of cells is 1, so the sum is 6.